How to Read the Crosswalk Document

This West Virginia Crosswalk document is designed to help readers easily understand the similarities and differences between the Next Generation (NxG) WV Content Standards and Objectives for Mathematics, which have been aligned with the *Common Core State Standards for Mathematics,* and the current 21st Century Content Standards and Objectives (CSOs) for Mathematics in WV Schools.

Grade Change (△) Next Generation WV Objective – WV 21st Century Objective.

Positive (+) Grade Change – Content moving to higher grade.

Negative (-) Grade Change – Content moving to lower grade

NxG WV State Objective Aligned to CCSS	WV 21st Century Objective	Grade△	Alignment	
	This objective is the currently adopted objective in WV Public Schools.	**+1 Positive Grade change; Content moving to the next higher grade** **0 No change** **-1 Negative Grade change; Content moving to previous or lower grade**	**Index** **3: Excellent** **2: Partial** **1: Weak** **0: No Match**	**The comment section will provide the reader with specific information relevant to the crosswalk between the standards identified. The intent is to provide the reader specific information relevant to any changes in student expectations.**

Seventh Grade Mathematics

How to Read the Crosswalk Document

The West Virginia Crosswalk document is designed to help readers easily understand the similarities and differences between the 21st Century Content Standards and Objectives for English Language Arts and Mathematics in WV Schools and the Next Generation WV Content Standards and Objectives for English Language Arts and Mathematics that have been aligned with the *Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science and Technical Subjects* and the *Common Core State Standards for Mathematics.*

NxG WV State Objective Aligned to CCSS	WV 21st Century Objective	Grade △	Alignment	Comment
M.7.RP.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*	**M.O.7.2.4** analyze proportional relationships in real-world situations, select an appropriate method to determine the solution and justify reasoning for choice of method to solve.	0	2	The NxG WV objective has deeper expectations for students regarding ratios of fractions.
M.7.RP.2 Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a	**M.O.8.1.3** analyze and solve grade-appropriate real-world problems with • whole numbers, • decimals, • fractions,	-1	2	The NxG WV objective has deeper expectations regarding proportional relationships visually and verbally.

proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. *c.* Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn* d. d. Explain what a point *(x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r)* where *r* is the unit rate.	• percents, percent increase and decrease, • integers, and including, but not limited to, rates, tips, discounts, sales tax and interest and verify solutions using estimation techniques.			
	M.O.4.2.2 recognize and describe relationships in which quantities change proportionally.	+3	2	The NxG WV objective incorporates deeper expectations regarding visual relationships.
	M.O.8.3.5 create scale models of similar figures using ratio, proportion with pencil/paper and technology and determine scale factor.	-1	2	The NxG WV objective addresses incorporates deeper expectations regarding visual relationships.
	M.O.7.2.9 identify a real life problem involving proportionality; make a hypothesis as to the outcome; develop, justify, and implement a method to collect, organize, and analyze data; generalize the results to make a conclusion; compare the hypothesis and the conclusion; present the project using words, graphs, drawings, models, or tables.	0	3	There is a strong alignment.
	M.O.7.2.6 plot lines within the Cartesian coordinate plane from a table of values to solve mathematical real-world problems.	0	1	The NxG WV includes a broader approach regarding unit rates.
	M.O.8.1.3 analyze and solve grade-appropriate real-world problems with • whole numbers, • decimals, • fractions, • percents, percent increase and decrease, • integers, and	-1	1	The NxG WV objective requires students to communicate proportional relationships visually and verbally.

	including, but not limited to, rates, tips, discounts, sales tax and interest and verify solutions using estimation techniques.			
M.7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*	**M.O.8.1.3** analyze and solve grade-appropriate real-world problems with • whole numbers, • decimals, • fractions, • percents, percent increase and decrease, • integers, and including, but not limited to, rates, tips, discounts, sales tax and interest and verify solutions using estimation techniques.	-1	3	The NxG WV objective provides a broader approach to the concept of proportional relationships.
M.7.NS.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* b. Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is	**M.O.7.1.1** compare, order, and differentiate among integers, decimals, fractions, and irrational numbers using multiple representations (e.g., symbols, manipulatives, graphing on a number line).	0	2	The NxG WV objective provides a broader approach to the concept of additive inverse and absolute value.
	M.O.6.1.9 develop and test hypotheses to derive the rules for addition, subtraction, multiplication and division of integers, justify by using real-world examples and use them to solve problems.	+1	3	The NxG WV objective provides a broader approach to the concept of additive inverse and absolute value.
	M.O.7.1.3 using simple computation and problem-solving situations, demonstrate fluency and justify solutions in performing operations with rational numbers including negative numbers for • adding	0	3	The NxG WV objective provides a broader approach to the concept of additive inverse and absolute value.

positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts c. Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers.	• subtracting • multiplying • dividing.			
	M.O.7.1.4 justify the use of the commutative, associative, distributive and inverse properties to simplify numeric expressions.	0	1	The NxG WV objective focuses on the binary operations of rational numbers using inverses.
M.7.NS.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading	**M.O.6.1.9** develop and test hypotheses to derive the rules for addition, subtraction, multiplication and division of integers, justify by using real-world examples and use them to solve problems.	+1	3	The NxG WV objective provides a broader approach to the concept of multiplicative inverse.
	M.O.7.1.3 using simple computation and problem-solving situations, demonstrate fluency and justify solutions in performing operations with rational numbers including negative numbers for • adding • subtracting	0	3	The NxG WV objective provides a broader approach to the concept of multiplicative inverse.

to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If *p* and *q* are integers, then – (*p*/*q*) = (–*p*)/*q* =*p*/ (–*q*). Interpret quotients of rational numbers by describing real world contexts. c. Apply properties of operations as strategies to multiply and divide rational numbers. a. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	• multiplying • dividing.			
M.7.NS.3. Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)	**M.O.7.1.3** using simple computation and problem-solving situations, demonstrate fluency and justify solutions in performing operations with rational numbers including negative numbers for • adding • subtracting • multiplying	0	3	There is a strong alignment.

	• dividing.			
	M.O.8.1.3 analyze and solve grade-appropriate real-world problems with • whole numbers, • decimals, • fractions, • percents, percent increase and decrease, • integers, and including, but not limited to, rates, tips, discounts, sales tax and interest and verify solutions using estimation techniques.	-1	3	There is a strong alignment.
M.7.EE.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.			0	
M.7.EE.2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*	**M.O.7.2.2** evaluate algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations.	0	2	The NxG WV objective provides a deeper approach to the concept of algebraic expressions.
M.7.EE.3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the	**M.O.7.1.5** analyze and solve grade-appropriate real-world problems with whole numbers, integers, decimals, fractions and percents including problems involving • discounts, • interest, • taxes, • tips, • percent increase or decrease, and	0	3	There is a strong alignment.

reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*	justify solutions including using estimation and reasonableness.			
M.7.EE.4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*	**M.O.A1.2.1** formulate algebraic expressions for use in equations and inequalities that require planning to accurately model real-world problems.	-2	3	There is a strong alignment.

b. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*				
M.7.G.1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	**M.O.7.3.4** pose and solve ratio and proportion problems including scale drawings and similar polygons.	0	3	There is a strong alignment.
	M.O.7.3.5 solve mathematical real-world problems using compound geometric figures.	0	1	The NxG WV objective focuses on scale drawings.
	M.O.8.3.5 create scale models of similar figures using ratio, proportion with pencil/paper and technology and determine scale factor.	-1	3	There is a strong alignment.
M.7.G.2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more	**M.O.G.3.10** investigate measures of angles and lengths of segments to determine the existence of a triangle (triangle inequality) and to establish the relationship between the measures of the angles and the length of the sides (with and without technology).	-3	3	There is a strong alignment.

than one triangle, or no triangle.				
M.7.G.3. Describe the two-dimensional figures that result from slicing three dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	**M.O.8.3.6** make and test a conjecture concerning • regular polygons, • the cross section of a solid such as a cylinder, cone, and pyramid, • the intersection of two or more geometric figures in the plane (e.g., intersection of a circle and a line), and justify the results.	-1	3	There is a strong alignment.
M.7.G.4. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	**M.O.6.4.1** determine an approximation for pi using actual measurements.	+1	3	There is a strong alignment.
	M.O.7.4.1 select and apply an appropriate method to solve (including, but not limited to, formulas) justify the method and the reasonableness of the solution, given a real-world problem solving situation involving. perimeter • circumference • area • surface area of prisms (rectangular and triangular) • volume of prisms and cylinders distance and temperature (Celsius, Fahrenheit).	0	2	The NxG WV objective provides a deeper approach to the concept of circles.
M.7.G.5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	**M.O.7.3.1** identify and construct • angle-pairs adjacent, complementary, supplementary, vertical • congruent segments and angles • perpendicular bisectors of segments angle-bisectors.	0	2	The NxG WV objective requires a deeper understanding of the concept of angles to solve equations.
M.7.G.6. Solve real-world and	**M.O.7.3.6** solve mathematical real-	0	3	The NxG WV objective is more specific

mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	world problems using compound geometric figures.			regarding types of geometric figures.
	M.O.7.4.1 select and apply an appropriate method to solve (including, but not limited to, formulas) justify the method and the reasonableness of the solution, given a real-world problem solving situation involving • perimeter • circumference • area • surface area of prisms (rectangular and triangular) • volume of prisms and cylinders • distance and temperature (Celsius, Fahrenheit).	0	1	The NxG WV objective emphasizes area and volume.
M.7.SP.1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.			0	
M.7.SP.2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or			0	

predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*				
M.7.SP.3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of a variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*			0	
M.7.SP.4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For examples,* decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science			0	

book.				
M.7.SP.5. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	**M.O.6.5.3** perform simple probability events using manipulatives; predict the outcome given events using experimental and theoretical probability; express experimental and theoretical probability as a ratio, decimal or percent.	+1	2	The NxG WV objective provides extensive opportunities for in-depth understanding regarding reasonableness.
M.7.SP.6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	**M.O.8.5.2** compare the experimental and theoretical probability of a given situation (including compound probability of a dependent and independent event).	-1	3	There is a strong alignment.
M.7.SP.7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by	**M.O.8.5.4** analyze problem situations, games of chance, and consumer applications using random and non-random samplings to determine probability, make predictions, and identify sources of bias.	-1	2	The NxG WV objective provides extensive opportunities for in-depth understanding specifically regarding the probability model.

assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.* **b.** Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*				
M.7.SP.8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the	**M.O.4.5.3** design and conduct a simple probability experiment using concrete objects, examine and list all possible combinations using a tree diagram, represent the outcomes as a ratio and present the results.	+3	1	The NxG WV objective addresses compound probability.
	M.O.8.5.2 compare the experimental and theoretical probability of a given situation (including compound probability of a dependent and	-1	3	There is a strong alignment.

compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event. **c.** Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*	independent event).			
	M.O.5.5.1 construct a sample space and make a hypothesis as to the probability of a real life situation overtime, test the prediction with experimentation, and present conclusions (with and without technology).	+2	3	There is a strong alignment.
	M.O.7.5.1 determine theoretical probability of an event, make and test predictions through experimentation determine theoretical probability of an event, make and test predictions through experimentation.	0	2	The NxG WV objective develops an in-depth understanding of compound events.
	M.O.7.5.2 determine combinations and permutations by constructing sample spaces (e.g., listing, tree diagrams, frequency distribution tables).	0	1	The NxG WV objective develops an in-depth understanding of compound events.